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I. A Letter of the curious Mr. Henry Barham, R. S. Soc. to Sir Hans Sloan, Bart. Vice-President of the Royal Society; giving several Experiments and Observations on the production of Silk-Worms, and of their Silk in England, as made by him last Summer.

Worthy Sir,

As you are the Patron of Industry and encourager of Natural Experiments, I think you justly claim the first View of these small ones, I made upon *Silk Worms*, the last Summer.

And altho' they may have been done before by others in some other parts of the World; yet in all the Authors I have Read I do not find they make use of the same Method; and I dare be bold to say, that these following Observations and Experiments were never made in *England* with that Nicety, as I have done, and shall do if I live. It being the first Attempt of this kind, it may come short of that compleat Methodical Manner it may be brought to hereafter; the which I hope you'll excuse.

After you have perufed it your self, if you fee any thing in it worthy the Communicating to the *Royal Society* (it being design'd for the Publick) you may do me the Honour. But I wholly submit to your Judgment and Opinion in this, as I do in all other things whatsoever.

I am,
Your humble Servant.

Henry Barham.

Experiments made in *Chelsea Park*, in the Months of *May June and July 1719.*

April 27. I receiv'd a small parcel of *Silk-Worms* Eggs from *Languedoc.*

May 6. Early in the Morning I found them Hatcht of themselves, the Wind shifting in the Night from *East North-therly* to the *West Southerly*, changing the Air of a sudden to Warm, two Days before the change of the Moon.

After Feeding and Managing them according to Art, through the whole Course of their four Sickneses, they were come to their State of Perfection, being then as thick as a Man's little Finger, and from 4 to 5 Inches long, of a yellowish Colour, and when held against the Light, they might

might be seen through as you may an Egg, being of the same Colour and Consistence (fill'd with the matter that makes the Silk) This is a certain Sign that they will begin to Spin in 24 Hours or less. They then forsake their Food (being very Voracious before) and hunt about for a convenient Place to fix their first Hold-fasts, for supporting the Balls or Cones that they are to make, which they do in a most wonderful Mathematical Manner, with a Mixture of a Gummy Substance that tyes all together ; and when the loose furzy Substance is taken off, and some of the Silk is wound off, the remainder is so Smooth and Compact, shining like *Satin*, that they are made use of for Artificial Flowers, and esteemed the best of any thing yet known for that purpose, for which (only) they are generally kept in *Boarding Schools*. I weighed many hundreds of these Silk-Balls or Cones, which I found to weigh from 35 to 40 Grains, with their *Aurelia's* or *Chrysalis* within them.

June 27. They begun to Spin, having been Hatcht 7 Weeks and 3 Days ; and in 4 or 5 Days finished their laborious and curious Work : but their Balls were not fit to be removed until 8 or 10 Days.

July 7. Mons^r. *Lachivre* began to wind off their Silk-Balls with a Machine that made great dispatch, winding much fine Silk in a Day : I found that an Ounce of Silk-Balls would make about a Dram of fine Silk ; but to be more certain, I weighed out to the Winder 12 Pounds of Silk-Balls at 4 times, and told the Balls in every 3 Pound as followeth, *viz.*

The first 3 Pound contained 812 Balls

The second 3 Pound contained 842

The third 3 Pound contained 797

The fourth 3 Pound contained 868

So that the whole 12 lib. Weight contained 3319 Balls.

Which when wound off, was found to yield and make one Pound and one Ounce, or 17 Ounces of fine Silk, and about 7 Ounces of coarse Refuse unwound, in all a Pound and half of *Averdupois* Weight, or 2 Pounds *Troy* ; which is as great or greater making or yielding as in any part of the World, and the Silk as fine. I shewed it to a noted *Silk Broker*, who said it was *Italian Silk*, (not knowing it was made in *England*) and worth about 20 *Shillings per Pound*, if I had never so many Bales of it, &c.

Now

Now upon this Experiment finding that 3319 Silk-Balls would make one Pound and one Ounce of fine Silk. I was desirous to know what quantity of Silk might be expected from the Worms Hatched from one Ounce of Eggs.

Of which to obtain the Knowledge, I made use of the following Method: by often weighing and telling I found that one hundred Eggs weighed but one Grain, so that if one Grain contains 100, a Scruple must contain 2000, and a Dram 6000, and an Ounce at 8 Drams to the Ounce, must contain 48000 Eggs. Now if every Egg hatch a Worm, and every Worm makes a Silk-Ball, there must be from one Ounce 48000 Silk-Balls; and if 3319 Balls will make one Pound and one Ounce of fine Silk, (which by Experience I found they did) then 48000 Silk-Balls will make 15 Pounds and 6 Ounces of *Averdupois* Weight in fine Silk, or 18 Pounds and eight Ounces of *Troy* Weight, which is very considerable. And in the same Proportion one Pound of *Silk Worms* Eggs, will produce Worms sufficient to make above 180 Pounds of Silk. But allowing for Casualties, and supposing but 12 Pound of fine Silk made from the Worms and their Silk-Balls produced from an Ounce of *Silk Worms* Eggs; it will be found much to exceed most Countries, according to *Augustino Gallo's* Computation: For he sayeth, that in the Southern parts of *France*, viz. *Languedoc* and *Provence*, they make but 7 or 8 Pound of Silk from *Silk Worms* hatched from an Ounce of Eggs; and in *Brescia* in *Italy*, but 8, 9, or 10 Pound of Silk from an Ounce; only in *Calabria*, where the *Silk Worms* and their Eggs are larger, they make 11 or 12 Pounds of Silk from an Ounce of Eggs; which still doth not exceed, nay hardly comes up to, what we make in *England*.

As to the Charge and Expences of making the aforesaid quantity of Silk in *England*, different from that of other Places, I shall be able to give you a more particular Account in my next Experimental Observations.

I have only this to add, that Experience hath taught me how to hatch *Silk Worms* twice in a Year, so as to have two good Crops of Silk in one Year. And that the *Mulberry* Trees will have Leaves in *England* twice in a Year, without prejudice to either Tree or Fruit, is most certainly true. But more in my next.